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ATO Overview

CLIP FROM OLD "OUTER-LIMITS" INTRO: "There is nothing wrong with your television set...do not attempt to adjust the picture...we will control the horizontal...we will control the vertical. For the next hour, sit quietly, and we will control all that you see and hear."

From Sun Tsu's lightning bolt...to Clausewitz's command of the heights...to Napoleon's plan of campaign...to today's War on Terror—that's what it all comes down to. Control the battlesphere—and you control the outcome. Control of not only the horizontal and the vertical—but an omni-dimensional ability to control every aspect of any conflict that is relevant to victory. Define its outer limits and you can define victory—on your terms.

That kind of control has been the dream of commanders for centuries, but it's never been even remotely possible...Until now.

Not that our control of the battlesphere can ever be as complete as we'd like—but we can now advance our abilities by quantum leaps. And perhaps the greatest significance of that kind of military dominance will be felt before the first shot is ever fired—as fewer and fewer adversaries will want to risk the kind of confrontation that triggers conflict. Which is why, if I had to pack it all into a single phrase—if I wanted to draw a single line that connects the dots of every program in our domain—control of the battlesphere is what ATO is all about.

At ATO, we see our mission as moving beyond the outer limits of warfare—to extend the outer limits of the battlesphere—on our terms.

In 21st Century conflict, controlling the battlesphere requires controlling the information flow for both friend and foe. As we extend the outer-limits of the battlesphere, we will control what the adversary sees and hears and thus what he believes to be true.

The adversary's network will operate—when we want it to operate. The adversary's network will contain the information we want it to contain. In such an information environment, the only choice open to an adversary is to doubt all of his information—giving an entirely new level of meaning to the phrase "fog of war."

Simultaneous to enveloping the adversary in the fog of untrustworthy or incomplete information, we will continue to lift the fog of war from our own forces. We can develop communication systems that connect any coalition partner to any other partner. We can seamlessly join forces that are dynamically moving about the physical battlespace.

And we can take the battle to cyberspace—protecting our own systems and disabling the adversary, to seize the advantage—and prevail.

In a few minutes, four of our ATO project managers are going to give you a sense of the project areas and programs we're attacking in our effort to move beyond the outer limits of the battlesphere—today's and tomorrow's.

My role [this afternoon is to give you a sense of the frame of mind that animates ATO—our way of looking at the world, and what it means, in terms of who we are, how we do what we do, and who we're looking for to help us do it.

To put it as simply as I can—we're looking for the 100th Physicist.

Let me explain.

Maybe you're heard the story—100 physics students in a college class were asked to determine the height of their building using a barometer. As you would expect many of the students answered the question correctly by stating they would use the barometer to determine the altitude at the bottom and top of the building and find the height of the building from the difference. There was a small group who didn't understand the question at all, but there was one student who answered it quite differently.

His professor called this individual in and asked him to explain his answers and why he should get any credit at all for the exam. The student said he thought there were many ways to determine the height:

- Drop the barometer from the top of the building and measure the time it takes to hit the ground—a simple formula involving the gravitational constant that yields the height.
- Tie a rope to the barometer and lower it over the edge. Measure the length of the rope to determine the height.
- He continued with several other different approaches.
- Finally the student said that the best solution was to take the barometer to the basement and knock on the building superintendent's door. When he answers tell him "Mr. Superintendent, I have a very fine barometer here. If you tell me the height of this building-I'll give it to you."

The professor in total exasperation said "don't you know the real answer?" To which the student replied, "Of course, but that's too easy. I wanted to explore different ways to get to the correct answer!"

This is the mindset we're looking for at ATO the ingenious ability to see a problem from different angles...to shift from conventional to unconventional thinking in the search for solutions ...to challenge assumptions...and to step back and ask a different question. This is what we mean by exploring "the outer boundaries of technology" in our quest for original ideas.

Sometimes, like in the story of the barometer, this yields a simpler approach. And then again, sometimes it's better to do things the hard way. That's what we did in ATO with a program called ACN: Adaptive C4ISR Node.

My purpose this afternoon in citing ACN isn't to offer it up as the quintessential ATO program—one of our greatest hits, as it were. But what ACN offers is a solid example of the ATO approach—the mindset we bring to our mission.

ACN isn't a program ATO initiated—it's one we inherited when we were established three years ago. The challenge was clear enough: On the battlefield, how can we help people in the same theater equipped with different communication systems talk to one another? In fact, we faced the same issue on the home front September 11th, when the rescue teams on-site at the Pentagon and at Ground Zero found that the firefighters couldn't talk to the police who couldn't talk to the EMT squads, who in turn couldn't talk to DoD or FEMA or the FBI...You get the picture.

Just as the challenge posed in the initial ACN program was straightforward—so, too, was the proposed solution: ACN would be a kind of phone booth in the sky connecting a bunch of different calls onto the same line. We looked over this approach within ATO, and decided if we were going to make this work we had to make things a little more difficult. Instead of a phone booth, what if we built a switch-node in the sky? It can connect all "callers," if you will, on the same line. But because of the way it accomplishes that aim, it can also do SIGINT.

And because it can interrogate signals and their source, it can also do electronic warfare—and send a little static the bad guys' way. And because it can communicate with signals to see which ones are "hostile," it can also do information warfare—inserting bad data into the enemy's info-stream, to confuse the folks who rely on it. Suddenly, the enemy's red space just got a little bit bigger—the same time our side's is getting smaller.

Not bad... for a radio.

Has the ATO version of ACN been more difficult to execute?

Yes, it has. But it also changes the whole paradigm of how the military can use the battlesphere—and enables an entirely new way of fighting. And that's a critical calculation in the ATO approach.

But the best way to get a sense of the ATO approach is to get a glimpse of ATO in action, which is precisely what we plan to do with our four presenters today.

First, Anup Ghosh, will tell you about a series of Information Assurance programs designed to secure the integrity of our communications networks against intrusions and cyber-assault.

Next, Jim Freebersyser, will take you through ATO's communications initiatives, where we're working to network existing but incompatible communications equipment, develop more agile, intelligent future communications systems, and extend networks down to the individual warfighter in the field, and back to the desk of decision-makers at the same time, real-time.

Preston Marshall will provide an update on a promising program we call X-G: An exciting approach to overcome the so-called "spectrum shortage"—an approach with the potential to revolutionize both civilian and military radio frequency communications.

Fourth and finally, Tom Altshuler will share with you an ATO project that's just about to enter the Army inventory. It's a very practical application of ATO technology to revolutionize mine warfare.

I'll close off our presentations with some final thoughts on moving beyond the outer-limits of the battlesphere—and a few of the new initiatives ATO's envisioning that will help do just that. So, for the next 80 minutes or so, do not attempt to adjust the picture. Just sit back and relax. You are about to embark on a great adventure—one that leads from the inner minds of ATO to the outer limits of warfare.